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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,965	03/25/2004	Raghunath Vitthal Chaudhari	A36200-PCT-USA-A; 066123.	7075
21003	7590	02/10/2005	EXAMINER OH, TAYLOR V	
BAKER & BOTTS 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			ART UNIT 1625	PAPER NUMBER

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,965

Applicant(s)

CHAUDHARI ET.AL.

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/9/04</u> . | 6) <input type="checkbox"/> Other: ____ |

The Status of Claims:

Claims 1-23 are pending.

Claims 1-23 have been rejected.

DETAILED ACTION

1. Claims 1-23 are under consideration in this Office Action.

Priority

2. it is noted that this application is a continuation of PCT/IB03/06202 filed 12/26/2003.

Drawings

3. None.

Specification

The disclosure is objected to because of the following informalities:

In paragraph (0016) on page 5 , the phrase " the molar concentration ratio of hydroxyl compound and enol ester" of the sentence " the molar concentration ratio of hydroxyl compound and enol ester is not less than one" is recited. The conjunction "and " between hydroxyl compound and enol ester is improper. The examiner recommends to change to "and " to " to " in that sentence. Appropriate correction is required.

On the lines 5-8, paragraph (0020) and the line 9 on page 6 , there are some space between the words. This is improper. Appropriate correction is required.

Claim Objections

Claims 1 and 23 are objected to because of the following informalities:

In claim 1, the term "atom " is recited. An article "an" is absent in front of the term " atom." Therefore, appropriate correction is required.

In claim 23, the claim number is mis-labeled as claim 22. Therefore, appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-3 ,5-6, 11-14, 19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "a molar concentration ratio in the range of 25:1 to 1,000:1" in line 2 of the claim. This claim depends on claim 1 ,which does not have any description of moles of the enol ester , the palladium catalyst , and the range of the

molar concentration ratio. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation " a molar concentration ratio not less than one " in line 2 of the claim. This claim depends on claim 1 ,which does not have any description of moles of the hydroxy compound, the enol ester, and the range of the molar concentration ratio between them. There is insufficient antecedent basis for this limitation in the claim. Furthermore, this claim is vague and indefinite. There is uncertainty as to which one of the hydroxy compound and the enol ester is more than one regarding its molar concentration ratio. Therefore, an appropriate correction is required.

In claims 5 and 6 , the phrase "alkyl group containing " is recited. This is vague and indefinite. The term " containing " would mean that there are other additional components besides the only alkyl group. Therefore, an appropriate correction is required.

In claims 11-14, the phrase "a compound containing " is recited. This is vague and indefinite. The term " containing " would mean that there are other additional components besides the only compound. Therefore, an appropriate correction is required.

Claim 19 recites the limitation "separating by vacuum distillation or solvent extraction the palladium catalyst " in lines 1-2 of the claim. This claim depends on

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claim 1 ,which does not have any description of separating by vacuum distillation or solvent extraction the palladium catalyst. There is insufficient antecedent basis for this limitation in the claim. Therefore, an appropriate correction is required.

Claim 22 recites the limitation "separating by vacuum distillation or solvent extraction the acid catalyst " in lines 1-2 of the claim. This claim depends on claim 1 ,which does not have any description of separating by vacuum distillation or solvent extraction the acid catalyst. There is insufficient antecedent basis for this limitation in the claim. Therefore, an appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5-10, 14-15, 17, 20, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Cesa et al (EP 0144118).

Cesa et al discloses the preparation of 2-hydroxy carboxylic acid by the reaction of enol acylates with carbon monoxide and an organic hydroxyl compounds to produce

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esters hydrolysable to hydroxy acids (see page 1 ,lines 1-9) in the following examples below:

EXAMPLE 11

0.50 mmoles vinyl acetate and 2.5 mmoles methanol were charged into a 71 cc stainless steel bomb equipped with a glass liner and a Teflon coated stir bar. 16.9 mole percent, based on vinyl acetate, of a catalyst comprising $\text{Pd}(\text{P}\phi_3)_4$, was added. 0.05 mmoles toluene was included as an internal standard. Five milliliters of tetrahydrofuran as a solvent were also included in the reaction system. The reaction mixture was charged under argon. The bomb was sealed and carbon monoxide at a pressure of 850 psi (at room temperature) was charged to the bomb, and the bomb was heated to 100°C and allowed to react for 43.5 hours with stirring. At the termination of the reaction, the reaction products were analyzed by gas chromatography and it was found that methyl 2-acetyloxypropanoate was produced in a yield of 35.1 percent.

(see example 11 , lines 15-29).

Furthermore, according to Example 16 , methyl 2-acetyloxypropanoate was hydrolyzed to lactic acid by adding it with 2 N aqueous HCl solution; the reaction mixture was allowed to cool to room temperature (see example 16 ,lines 21-26).

This is identical with the claims.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-12, and 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cesa et al (EP 0144118) in view of Nicholson et al (US 5,744,650).

Cesa et al discloses the preparation of 2-hydroxy carboxylic acid by the reaction of enol acylates with carbon monoxide and organic hydroxyl compounds to produce

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esters hydrolysable to hydroxy acids (see page 1 ,lines 1-9) in the following examples below:

EXAMPLE 11

0.50 mmoles vinyl acetate and 2.5 mmoles methanol were charged into a 71 cc stainless steel bomb equipped with a glass liner and a Teflon coated stir bar. 16.9 mole percent, based on vinyl acetate, of a catalyst comprising $\text{Pd}(\text{P}\phi_3)_4$, was added. 0.05 mmoles toluene was included as an internal standard. Five milliliters of tetrahydrofuran as a solvent were also included in the reaction system. The reaction mixture was charged under argon. The bomb was sealed and carbon monoxide at a pressure of 850 psi (at room temperature) was charged to the bomb, and the bomb was heated to 100°C and allowed to react for 43.5 hours with stirring. At the termination of the reaction, the reaction products were analyzed by gas chromatography and it was found that methyl 2-acetyloxypropanoate was produced in a yield of 35.1 percent.

(see example 11 , lines 15-29).

Furthermore, according to Example 16 , methyl 2-acetyloxypropanoate was hydrolyzed to lactic acid by adding it with 2 N aqueous HCl solution; the reaction mixture was allowed to cool to room temperature (see example 16 ,lines 21-26).

Usually, the reaction is carried out with a solvent. The solvent selected from the group consisting of tetrahydrofuran , benzene, acetonitrile, tetrahydrofuran (see page 5 ,lines 30-37). After the reaction is complete, the ester products can be recovered from the reaction system by vacuum distillation (see page 7 ,lines 15-17).

In addition, the reactant concentrations can vary widely and are not critical. The ratio of hydroxy reactant to the enol ester is usually no greater than 10/1 on a molar basis (see page 5 ,lines 21-23); the amount of catalyst is between 0.01 and 100 mole percent based on the enol ester (see page 5 ,lines 27-28).

The instant invention, however, differs from the prior art in that the claimed hydrolysis catalyst is recycled for the hydrolysis step is unspecified; the claimed organic ligand contains pyridine and triethyl amine.

Nicholson et al discloses a general carbonylation process (see col. 46 ,lines 53-54) in which one or more reactants are reacted in a solvent selected from the group of acetone, methyl ethyl ketone, toluene, and tetrahydrofuran (see col. 34 ,lines 46-50) in the presence of carbon monoxide and palladium-organopolyphosphite ligand (see col. 7 ,lines 31-32) containing pyridine , triethyl amine ,and etc (see col. 8 ,line 13) to produce a reaction product fluid (see col. 3 , lines 21-26) , wherein the desired product can be separated via distillation (see col. 36 , lines 29-30); furthermore, Nicholson et al has offered guidance with the remaining non-volatilized catalyst containing liquid reaction mixture which is recycled back to the reactor (see col. 36, lines 33-35).

With respect to the unspecified recycling step for the hydrolysis catalyst, the Cesa et al reference is silent. However, the Nicholson et al reference does teach that

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the recycling step for the carbonylation catalyst is a well-known procedural aspect for its economical benefit; by the same token, it is quite possible to recycle the hydrolysis catalyst used in the Cesa et al process for the sake of the economical process.

Cesa et al does disclose the preparation of lactic acid by the reaction of enol acylates with carbon monoxide and the organic hydroxyl compounds to produce esters hydrolysable to hydroxy acids. Similarly, Nicholson et al expressly teaches that it is possible to apply the recycling step of the catalyst during the carbonylation process (see col. 10 ,lines 32-35). The Cesa et al process is related to the carbonylation process and the hydrolysis process, whereas the Nicholson et al is concerned with the carbonylation process plus the recycling step of the catalyst; from this, there is a teaching of an equivalence between them with respect to the common carbonylation process. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the Nicholson's et al recycling step into the Cesa et al process in order to economize the overall process because the skilled artisan in the art would expect such a combination to be successful and economical as the guidance(see col. 36, lines 33-35) shown in the Nicholson et al process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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